

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1-3. (canceled).

4. (currently amended): A method of correcting links in a document stored on a local server, comprising:

sending a first request from the local server to a link checking service unit of a remote server to determine whether a first resource in the remote server corresponding to a first link in the document is located at said first link;

receiving a first response to said first request from the remote server, the first response containing an indication that the first resource is not located at the first link, wherein the remote server generates the indication by referring to a mapping table stored on the remote server to determine that the first resource is not located at the first link, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

automatically changing the document in response to the receiving of the first response, based on the indication, wherein said changing of the document comprises automatically replacing the first link or automatically deleting the first link; and

automatically sending a second request from the local server to the link checking service unit of the remote server to determine whether a second resource in the remote server corresponding to a second link in the document is located at the second link after the changing of the document,

wherein a status code stored in the mapping table in association with the first resource comprises one of a first status code that indicates that the first resource has moved from a prior location stored in the mapping table in association with the first resource to a new location stored in the mapping table in association with the first resource, and a second status code that indicates that the first resource has been permanently removed from the remote server, and

wherein a status code stored in the mapping table in association with the second resource comprises a third status code which indicates that the second resource is located at a prior location stored in the mapping table in association with the second resource.

5. (previously presented): The method of claim 4, wherein the response further includes a link status code indicating a status of the first resource.

6. (previously presented): The method of claim 4, wherein the document is a World-Wide Web page and the first link is a hypertext link.

7. (previously presented): The method of claim 4, wherein the first link includes a first uniform resource locator (URL) and the indication includes a second URL, wherein the document is changed by changing the first URL in the first link to the second URL.

8. (previously presented): The method of claim 4, wherein the document is changed by automatically deleting the first link in the document if the first response does not include a replacement link and contains a link status code indicating that the first link is invalid.

9. (previously presented): The method of claim 4, wherein said sending the first request, receiving the first response, and changing the document are performed in a web server.

10-14. (canceled).

15. (currently amended): A method for determining a status of links in a document stored on a local server, comprising:

receiving a first request from the local server to determine whether a first resource of a remote server is located at a first link in the document, wherein the first link includes a first location indicator of the first resource;

detecting, by the remote server, if the first resource is present within a storage unit at a location indicated by the first location indicator by referring to a mapping table stored on the

remote server, wherein said mapping table ~~stores~~indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

determining, by the remote server, if the first resource is present at an alternate location if the first resource is not detected in the location indicated by the first location indicator by referring to the mapping table;

in response to the first request, returning, by the remote server, an alternate location identifier indicating the alternate location of the first resource if the first resource is determined to be present at the alternate location, wherein the document is automatically changed in response to the returning of the alternate location identifier by automatically replacing the first link with another link comprising the alternate location identifier; and

receiving a second request which is automatically sent from the local server after the document is automatically changed, to determine whether a second resource of the remote server is located at a second link in the document, wherein the second link includes a second location indicator of the second resource,

wherein a status code stored in the mapping table in association with the first resource comprises a first status code that indicates that the first resource has moved from the location indicated by the first location indicator to the alternate location of the first resource, the location indicated by the first location indicator and the alternate location of the first resource being stored in the mapping table in association with the first resource, and

wherein a status code stored in the mapping table in association with the second resource comprises one of a second status code that indicates that the second resource has been permanently removed from the remote server, and a third status code which indicates that the second resource is located at a location indicated by the second location indicator which is stored in the mapping table in association with the second resource.

16. (previously presented): The method of claim 15, wherein the first link is a hypertext link and the location indicator of the resource is a uniform resource locator (URL).

17. (previously presented): The method of claim 16, wherein the first resource is a web page.

18. (previously presented): The method of claim 16, further comprising returning a link status code indicating whether the first resource is present in the storage unit.

19. (previously presented): The method of claim 18, wherein the link status code indicates whether the first resource has been deleted from the storage unit.

20. (canceled).

21. (original): The method of claim 20, wherein the first and second location indicators are uniform resource locators (URLs).

22-30. (canceled).

31. (previously presented): The method of claim 4, wherein the link checking service unit is disposed in a first web server, and the first request is sent from a second web server different from the first web server.

32. (previously presented): The method of claim 15, wherein the first request is received by a first web server, and the alternate location identifier is returned to a second web server different from the first web server.

33. (previously presented): The method of claim 4, wherein the automatic changing of the document is performed before a status of any other link in the document is checked.

34. (previously presented): The method of claim 15, wherein the automatic changing of the document is performed before a status of any other link in the document is checked.

35. (currently amended): A system for correcting links to resources in a network, comprising:

~~a link checking service unit~~ of a remote web server comprising a link checking service unit; and

~~a link correction service unit~~ of a local web server comprising a link correction service unit,

wherein said link correction service unit sends a first request from the local server to the link checking service unit to determine whether a first resource in the remote server corresponding to a first link in a document stored on the local server is located at said first link,

wherein the link checking service unit of the remote server sends a first response to said first request to the link correction service unit, the first response containing an indication that the first resource is not located at the first link, wherein the link checking service unit of the remote server generates the indication by referring to a mapping table stored on the remote server to determine that the first resource is not located at the first link, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources,

wherein the link correction service unit automatically changes the document in response to the receiving of the first response, based on the indication, wherein said changing of the document comprises automatically replacing the first link or automatically deleting the first link; and

wherein the link correction service unit automatically sends a second request from the local server to the link checking service unit of the remote server to determine whether a second

resource in the remote server corresponding to a second link in the document is located at the second link after the changing of the document,

wherein a status code stored in the mapping table in association with the first resource comprises one of a first status code that indicates that the first resource has moved from a prior location stored in the mapping table in association with the first resource to a new location stored in the mapping table in association with the first resource, and a second status code that indicates that the first resource has been permanently removed from the remote server, and

wherein a status code stored in the mapping table in association with the second resource comprises a third status code which indicates that the second resource is located at a prior location stored in the mapping table in association with the second resource.

36. (previously presented): The system of claim 35, wherein said document is a World-Wide Web page, and said link is a hypertext link.

37. (currently amended): An apparatus for correcting a link in a document, comprising:

a document repository having stored therein one or more documents;

a corrected document repository having stored therein one or more corrected documents;

and



a link correction service unit connected to the document repository and the corrected document repository, and configured to correct link in a document among the one or more documents in the document repository,

wherein the link correction service unit:

sends a first request from a local server on which the link correction service is disposed to a link checking service unit of a remote server to determine whether a first resource in the remote server corresponding to a first link in the document is located at said first link;

receives a first response to said first request from the remote server, the first response containing an indication that the first resource is not located at the first link, wherein the remote server generates the indication by referring to a mapping table stored on the remote server to determine that the first resource is not located at the first link, wherein said mapping table ~~stores-indicates~~ changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

automatically changes the document in response to the receiving of the first response, based on the indication, wherein said changing of the document comprises automatically replacing the first link or automatically deleting the first link;

automatically sends a second request from the local server to the link checking service unit of the remote server to determine whether a second resource in the remote

server corresponding to a second link in the document is located at the second link after the changing of the document; and

stores a corrected document having the replaced first link in the corrected document repository,

wherein a status code stored in the mapping table in association with the first resource comprises one of a first status code that indicates that the first resource has moved from a prior location stored in the mapping table in association with the first resource to a new location stored in the mapping table in association with the first resource, and a second status code that indicates that the first resource has been permanently removed from the remote server, and

wherein a status code stored in the mapping table in association with the second resource comprises a third status code which indicates that the second resource is located at a prior location stored in the mapping table in association with the second resource.

38. (previously presented): The apparatus of claim 37, wherein the link is a hypertext link containing a uniform resource locator (URL) and the document is a web page.

39. (currently amended): An apparatus for correcting a link in a document stored on a local sever, comprising:

a processor;

means for sending, using the processor, a first request from the local server to a link checking service unit of a remote server to determine whether a first resource in the remote server corresponding to a first link in the document is located at said first link;

means for receiving a first response to said first request from the remote server, the first response containing an indication that the first resource is not located at the first link, wherein the remote server generates the indication by referring to a mapping table stored on the remote server to determine that the first resource is not located at the first link, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

means for automatically changing the document in response to the receiving of the first response, based on the indication, wherein said changing of the document comprises automatically replacing the first link or automatically deleting the first link; and

means for automatically sending a second request from the local server to the link checking service unit of the remote server to determine whether a second resource in the remote server corresponding to a second link in the document is located at the second link after the changing of the document,

wherein a status code stored in the mapping table in association with the first resource comprises one of a first status code that indicates that the first resource has moved from a prior location stored in the mapping table in association with the first resource to a new location stored

in the mapping table in association with the first resource, and a second status code that indicates that the first resource has been permanently removed from the remote server, and

wherein a status code stored in the mapping table in association with the second resource comprises a third status code which indicates that the second resource is located at a prior location stored in the mapping table in association with the second resource.

40. (currently amended): A ~~tangibly embodied~~ computer readable medium ~~of having~~ embodied thereon program instructions suitable for execution by a computer, the program instructions comprising:

program instructions for sending a first request from a local server on which a document is stored to a link checking service unit of a remote server to determine whether a first resource in the remote server corresponding to a first link in the document is located at said first link;

program instructions for receiving a first response to said first request from the remote server, the first response containing an indication that the first resource is not located at the first link, wherein the remote server generates the indication by referring to a mapping table stored on the remote server to determine that the first resource is not located at the first link, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

program instructions for automatically changing the document in response to the receiving of the first response, based on the indication, wherein said changing of the document comprises automatically replacing the first link or automatically deleting the first link; and

program instructions for automatically sending a second request from the local server to the link checking service unit of the remote server to determine whether a second resource in the remote server corresponding to a second link in the document is located at the second link after the changing of the document,

wherein a status code stored in the mapping table in association with the first resource comprises one of a first status code that indicates that the first resource has moved from a prior location stored in the mapping table in association with the first resource to a new location stored in the mapping table in association with the first resource, and a second status code that indicates that the first resource has been permanently removed from the remote server, and

wherein a status code stored in the mapping table in association with the second resource comprises a third status code which indicates that the second resource is located at a prior location stored in the mapping table in association with the second resource.

41. (currently amended):      An apparatus for correcting a link in a document stored on a local server, comprising:

a document repository having stored therein one or more documents on a remote server;  
a mapping table unit ~~having stored therein mapping table information associating a first prior resource locator with a first present resource locator, the first prior resource locator indicating a prior location of a first resource within the document repository and the first present~~

~~resource-locator indicating a present location of the first resource~~ stores prior locations of resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server; and

a link checking service unit connected to the document repository and the mapping table unit, and configured to:

receive a first request from the local server to determine whether the first resource is located at a first link in the document, wherein the first link includes the first prior resource-locator of the first resource;

detect if the first resource is present within the document repository at a location indicated by the first prior resource-locator by referring to the mapping table unit;

determine if the first resource is present at an alternate location if the first resource is not detected in the location indicated by the first prior resource-locator by referring to the mapping table unit;

in response to the first request, return the first present resource-locator indicating the alternate location of the first resource if the first resource is determined to be present at the alternate location, wherein the document is automatically changed in response to the returning of the alternate location identifier by automatically replacing the first link with another link comprising the first present resource-locator; and

receive a second request which is automatically sent from the local server after the document is automatically changed, to determine whether a second resource of the remote server is located at a second link in the document, wherein the second link includes a second location indicator of the second resource,

wherein a status code stored in the mapping table in association with the first resource comprises a first status code that indicates that the first resource has moved from the location indicated by the first location indicator to the alternate location of the first resource, the location indicated by the first location indicator and the alternate location of the first resource being stored in the mapping table in association with the first resource, and

wherein a status code stored in the mapping table in association with the second resource comprises one of a second status code that indicates that the second resource has been permanently removed from the remote server, and a third status code which indicates that the second resource is located at a location indicated by the second location indicator which is stored in the mapping table in association with the second resource.

42. (previously presented): The apparatus of claim 41, wherein the first prior and first present resource-locators are uniform resource locators (URLs).

43. (previously presented): The apparatus of claim 41, wherein the mapping table further includes a second prior resource-locator indicating a location of the second resource and a status code indicating a status of the second prior resource-locator.

44. (previously presented): The apparatus of claim 43, wherein the status code indicates that the second resource corresponding to the second prior resource-locator has been deleted.

45. (previously presented): The apparatus of claim 43, wherein the status code indicates that the second prior resource-locator indicates a present location of the second resource in the document repository.

46. (currently amended): An apparatus for determining a status of a link in a document stored on a local server, comprising:

a processor;

means for receiving, using the processor, a first request from the local server to determine whether a first resource of a remote server is located at a first link in the document, wherein the first link includes a first location indicator of the first resource;

means for detecting, by the remote server, if the first resource is present within a storage unit at a location indicated by the first location indicator by referring to a mapping table stored on the remote server, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;



means for determining, by the remote server, if the first resource is present at an alternate location if the first resource is not detected in the location indicated by the first location indicator by referring to the mapping table;

means for returning, by the remote server, in response to the first request, an alternate location identifier indicating the alternate location of the first resource if the first resource is determined to be present at the alternate location, wherein the document is automatically changed in response to the returning of the alternate location identifier by automatically replacing the first link with another link comprising the alternate location identifier; and

means for receiving a second request which is automatically sent from the local server after the document is automatically changed, to determine whether a second resource of the remote server is located at a second link in the document, wherein the second link includes a second location indicator of the second resource,

wherein a status code stored in the mapping table in association with the first resource comprises a first status code that indicates that the first resource has moved from the location indicated by the first location indicator to the alternate location of the first resource, the location indicated by the first location indicator and the alternate location of the first resource being stored in the mapping table in association with the first resource, and

wherein a status code stored in the mapping table in association with the second resource comprises one of a second status code that indicates that the second resource has been permanently removed from the remote server, and a third status code which indicates that the

second resource is located at a location indicated by the second location indicator which is stored in the mapping table in association with the second resource.

47. (currently amended): A ~~tangibly embodied~~ computer readable medium ~~of having embodied thereon~~ program instructions suitable for execution on a computer for determining a status of a link in a document stored on a local server, the program instructions comprising:

program instructions for receiving a first request from the local server to determine whether a first resource of a remote server is located at a first link in the document, wherein the first link includes a first location indicator of the first resource;

program instructions for detecting, by the remote server, if the first resource is present within a storage unit at a location indicated by the first location indicator by referring to a mapping table stored on the remote server, wherein said mapping table ~~stores~~ indicates changes that occur in locations of resources on the remote server by storing prior locations of the resources on the remote server, status codes indicating a status of the prior locations, and new locations of the resources on the remote server, said first resource being among said resources;

program instructions for determining, by the remote server, if the first resource is present at an alternate location if the first resource is not detected in the location indicated by the first location indicator by referring to the mapping table;

program instructions for returning, by the remote server, in response to the first request, an alternate location identifier indicating the alternate location of the first resource if the first resource is determined to be present at the alternate location, wherein the document is automatically changed in response to the returning of the alternate location identifier by

automatically replacing the first link with another link comprising the alternate location identifier; and

program instructions for receiving a second request which is automatically sent from the local server after the document is automatically changed, to determine whether a second resource of the remote server is located at a second link in the document, wherein the second link includes a second location indicator of the second resource,

wherein a status code stored in the mapping table in association with the first resource comprises a first status code that indicates that the first resource has moved from the location indicated by the first location indicator to the alternate location of the first resource, the location indicated by the first location indicator and the alternate location of the first resource being stored in the mapping table in association with the first resource, and

wherein a status code stored in the mapping table in association with the second resource comprises one of a second status code that indicates that the second resource has been permanently removed from the remote server, and a third status code which indicates that the second resource is located at a location indicated by the second location indicator which is stored in the mapping table in association with the second resource.